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THE GENUS GARGAPHIA STÅL

(TINGIDAE; HETEROPTERA)

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This paper is an attempt to bring together and up to date the taxonomic knowledge of this very interesting and characteristic genus. It is drawn up along the lines of the author's recent work on the genus *Corythucha* Stål, and is the third in a series of contributions to the knowledge of the family Tingidae, which family the writer hopes to monograph at some future date.

Gargaphia Stål embraces at the present time twenty-five species, five of which are herein described as new. The genus is limited in its distribution to North, Central and South America, and includes several species which are of economic importance as plant feeders.

Because of the fact that material, including types, of some of the South American forms has not been available for study, it has been impossible for the writer to redescribe them and hence to treat those species separately. However the lack of this degree of completeness is not sufficient to warrant the withholding of the detailed treatment of the remaining species. It is believed that until certain types in European museums can be studied this paper is as complete as possible.

The characters used in separating the species are quite a different set than are used in the genus *Corythucha*. The pronotal hood in *Gargaphia* is so much reduced that comparative measurements would hardly be reliable. The size and shape of the lateral margins of the pronotum, and the number of rows of areoles in the costal and subcostal areas of the elytra, are the most stable characters for the determination of species. The character of the head spines should also be taken into account.

Stål described *Gargaphia* as a subgenus of *Monanthia* in 1862, and then, in 1873, he gave it generic rank. His *patricia* is the logotype of the genus.

The writer has deemed it wise to redescribe all of the species known to him so as to conform to the idea of uniformity in description.

In the listing of the species no attempt is made at a natural or evolutionary order; instead, they are presented as they occur in the key.

GARGAPHIA Stål

1862. Stål, Stett. Ent. Zeit., xxiii, p. 324.
1873. Stål, Enum. Hemip., iii, pp. 119, 124.
1884. Uhler, Stand. Nat. Hist., ii, p. 285.
1887. Provancher, Pet. Faune Ent. Can., iii, p. 159.
1897. Champion, Biol. Centr.-Am., Heteropt., ii, p. 9.
1898. Champion, Proc. Ent. Soc. Lond., p. 58.
1916. Osborn and Drake, Ohio St. Univ., Bull., xx, p. 233.
1917. Drake, Ent. News, xxviii, p. 227.

This genus may be distinguished from all others of the family by the sinuous transverse carina interrupting the rostral groove between the meso- and metasternum. In general it may be characterized as follows: Head small, black, more or less shiny, with five prominent spines, three of which are on the front between the eyes and two at the base of head, one on either side. These basal spines may be erect or decumbent and reduced to mere threads. The frontal spines may be reduced to mere stubs. Antennae long, first and second segments stout, the first at least three times the length of the second, and about equal to the fourth in length, segments more or less hairy. Pronotum with a hood, varying in size with the species but never entirely covering the head, three longitudinal membranous carinae, and a wide membranous lateral margin which is more or less flaring and angular in some species. A transverse sinuous carina interrupts the rostral groove between the meso- and metasternum. Elytra lacy, with hyaline areoles at least in the costal area. Various areas of elytra well defined. Elytra narrowed at the base, never reflexed anteriorly as in *Corythucha*.

FOOD PLANT INDEX

The following list of food plants is given merely as an aid to identification. It is as complete as possible with the data at hand, which was taken from various publications and insect labels:

Amphiachyris species
  solani Heidemann
Basswood (*Tilia pubescens*)
  tiliae Walsh
Beans
  angulata Heidemann
Coffee Weed (*Cassia* species)
  solani Heidemann
Cotton (*Gossypium* species)
  solani Heidemann
Dahlia parryi
  condensa Gibson
Dahlia spinosa
  opacula Uhler
Egg plant (*Solanum melongena*)
  opacula Uhler
  solani Heidemann
False Indigo (*Amorpha fruticosa*)
  amorphae Walsh
Horse Nettle (*Solanum carolinense*)
  solani Heidemann
Mallow (*Malva* species)
  iridescens Champion
New Jersey Tea (*Ceanothus americanus*)
  angulata Heidemann
Night Shade (*Solanum* species)
  iridescens Champion
  solani Heidemann
Potato (*Solanum tuberosum*)
  solani Heidemann
Ragweed (*Ambrosia* species)
  iridescens Champion
Sage (*Salvia pitcheri*)
  solani Heidemann
Sand Nettle
  iridescens Champion
White Horse Nettle (*Solanum elaeagnifolium*)
  solani Heidemann
Wild Cherry (*Prunus serotina*)
  tiliae Walsh
Willow (*Salix* species)
  opacula Uhler

Distributional Groupings of Species

The grouping as here listed is also an aid to the identification of species. The definite limits of distribution of only a few species are known, hence the following should be considered merely as a guide:

Northern United States—*tiliae* Walsh.

Eastern United States—*amorphae* Walsh, *tiliae* Walsh, *iridescens* Champion, *angulata* Heidemann.

Southern United States—*tiliae* Walsh, *fasciata* Stål, *angulata* Heidemann, *solani* Heidemann.

Southwestern United States—*carinata* Gibson, *condensa* Gibson, *albescens* Drake, *iridescens* Champion, *opacula* Uhler, *angulata* Heidemann, *solani* Heidemann.

Western United States—*opacula* Uhler.

Central America (including Mexico)—*panamensis* Champion, *patricia* Stål, *nigrinervis* Stål, *vanduzeei* Gibson.

South America—*lasciva* Gibson, *magna* Gibson, *nigrinervis* Stål, *formosa* Stål, *trichoptera* Stål, *subpilosa* Stål, *flexuosa* Stål, *lunulata* Mayr, *munda* Stål, *obliqua* Stål, *tricolor* Mayr, *simulans* Stål.

Key to the Species

1. Costal area of elytra with less than four rows of areolae at its widest part.......................................10
Costal area of elytra with four or more rows of areolae at its widest part..2
2. Membranous margins of pronotum angularly expanded................3
Membranous margins of pronotum rounding........................5
3. Frontal spines produced, at least one-half the length of the basal segment of the antennae.......................................4
Frontal spines not produced, very short, mere stubs..**angulata** Heidemann
4. Angle of the membranous margin of pronotum sharp, pointed. Hood small....................................**nigrinervis** Stål
Angle of the membranous margin of pronotum not sharp or pointed. Hood large................................**solani** Heidemann
5. Length of the discoidal area noticeably less than one-half the length of elytra; narrow, in width about equal to the subcostal area...........6
Length of the discoidal area about one-half the length of elytra, width greater than subcostal area..................................7
6. Length of discoidal area barely one-third the length of the elytra. **panamensis** Champion
Length of discoidal area slightly more than one-third the length of elytra. **magna** new species
7. Subcostal area with but two rows of areolae........................9
Subcostal area with three rows of areolae..........................8
8. Apical angle of discoidal area about median.............**tiliae** Walsh
Apical angle of discoidal area at the outer side.........**amorphae** Walsh

9. All five frontal spines erect, long. Nervures of elytra concolorous. **fasciata** Stål
   The two basal spines not erect, median spine long, anterior spines not long. Nervures of elytra not of uniform color................**patricia** Stål
10. Costal area with two rows of areolae................................12
   Costal area with three rows of areolae..............................11
11. Nervures of elytra concolorous. Hood nearly as broad as long. **albescens** Drake
   Nervures of elytra not of a uniform color. Hood nearly twice as long as broad..................................**iridescens** Champion
12. Subcostal area with two rows of areolae............................13
   Subcostal area with three or more rows of areolae..................14
13. Lateral margins of pronotum angulate. Hood comparatively small. General color dark.........................**condensa** new species
   Lateral margins of pronotum rounding. Hood larger. General color light..................................**vanduzeei** new species
14. Subcostal area with less than four rows of areolae..................15
   Subcostal area with four rows of areolae............**lasciva** new species
15. Pronotal carinae low, without distinct areolae...........**opacula** Uhler
   Pronotal carinae high, with large clear areolae......**carinata** new species

Gargaphia angulata Heidemann

1899. Heidemann, Can. Ent., xxxi, p. 301.
1900. Chittenden, U. S. Dept. Agr., Div. Ent., Bull. n. s. xxiii, p. 32, fig. 8.
1910. Smith, Cat. Ins. N. J., edn. 3, fig. 63, p. 149.
1916. Osborn and Drake, Ohio St. Univ. Bull., xx, p. 233, fig. 6.
1917. Parshley, Occasional Papers Boston Soc. Nat. Hist., vii, p. 56.
1917. McAtee, Bull. Brooklyn Ent. Soc., xii, p. 79.
1917. Van Duzee, Catalogue of Hemiptera of North America, p. 218, no. 657.

Head dark shiny. Three frontal spines reduced to mere light colored conical stubs. Basal head spines mere decumbent hairs, not plainly visible without removing pronotal hood. First three segments of antennae light, concolorous, hairy. Fourth segment dark except basal third. Pronotum dark, punctate. Pronotal hood twice as long as broad. Three parallel carina with one row of areoles. Lateral membranous margins wide, with four rows of areoles at its widest point, distinctly angular. Membranous portions of pronotum yellowish or dirty white and hairy. Elytra with four rows of areoles at the widest part of costal area, subcostal area with two rows of areoles. Nervures of elytra yellowish. Length, 3.4 mm; width, 1.6 mm.

Type, a male from Auburn, Alabama, number 4371, in the United States National Museum. This and a long series of specimens from New Jersey to Arizona have been examined. Mr. H. M. Parshley records its capture in Massachusetts and Connecticut. It would, therefore, appear that its present distribution reaches from the New England States south and west to Arizona and inland to Missouri. Mr. McAtee states that *Ceanothus americanus* is the most common food plant of this species. It also feeds on beans to an economic extent.

Gargaphia nigrinervis Stål

1873. Stål, Enum. Hemip., iii, p. 125.
1897. Champion Biol. Centr.-Amer., Heteropt., ii, p. 10.

Head dark, eyes prominent. The frontal pair of head spines much reduced, barely more than stubs, in this respect resembling those of *angulata* Heidemann, but the median spine is long and erect. Basal spines also long and erect. First three segments of antennae reddish brown, third segment lighter towards apex. Fourth segment black. Pronotal hood small, more than twice as long as broad. Three parallel carinae normal. Lateral margins wide, flaring, and distinctly angulate, with four rows of areoles at point of greatest width. Angle sharp or pointed, margin rounded behind. Nervures of lateral margins brown. Elytra with five rows of areoles in costal area at its greatest width. Subcostal area with two rows of areoles. Discoidal area very short, about one-third the length of elytra. Five or six oblique nervures distinctly darkened, brown to black. Apex of elytra narrowed. Length, 3.7 mm.; width, 2.2 mm.

Eleven specimens from Panama are in the collection of the United States National Museum. Champion records its occurrence also in Colombia. Food plants of this species are not known.

Gargaphia solani Heidemann

1914. Heidemann, Proc. Ent. Soc. Wash., xvi, p. 136.
1915. Fink, U. S. Dept. Agri., Div. Ent., Bull. 239, pp. 1–7.
1916. Osborn and Drake, Ohio St. Univ. Bull., xx, p. 235, fig. 7.
1917. Van Duzee, Catalogue of Hemiptera of North America, p. 218, no. 658.

Head small, dark, eyes and rostral sulcus prominent. Three frontal head spines long, basal spines long, and more or less erect and protruding beyond hood. Basal joint of antennae dark. Second and third joints lighter, fourth dark except at base. Third and fourth antennal segments with numerous long hairs, those on first and second segments shorter and less conspicuous. Pronotal hood comparatively large for species of this genus, four times as long as wide, and as high or slightly higher than median carina. All three carinae comparatively high, with one distinct row of large areoles, and densely hairy. Lateral membranous margins of pronotum wide and distinctly angular, with at least five rows of areoles at their widest point and very hairy. Pronotum dark and punctate, membranous portions of pronotum light, yellowish, with nervures darkened in angle of lateral margins. Elytra with five rows of areoles at the widest part of costal area and three rows in subcostal area. Five transverse nervures of costal area blackened, more or less distinct. Apical angle of the discoidal area at outside. Legs pale, yellow. Length, 4 mm.; width, 2 mm.

Two specimens labelled types, in the collection of the United States National Museum, numbered 18810, have been examined. One was collected at Kirkwood, Missouri, the other in Lavaca County, Texas. Many other specimens are in the same collection from Maryland, west to Arizona. It would appear that this species occurs over the entire southern half of the United States. Its food plants include *Solanum carolinense* (Horse nettle), *Solanum elaeagnifolium*, *Cassia* species (Coffee weed), *Amphiachrus* species, *Salvia pitcheri*, *Solanum* species, eggplant, potato, and cotton. Mr. David E. Fink in Bulletin number 239, U. S. Dept. Agriculture gives an economic treatise of this species and includes descriptions of the egg and nymphal stages. He terms it the eggplant lace-bug.

Gargaphia panamensis Champion

1901. Champion, Biol. Centr.-Amer., Heteropt., ii, p. 10.

The writer, having seen no specimens of this species, is unable to give a redescription, and therefore includes a copy of the original description, which is in such detail as to make its identity fairly certain.

"Moderately elongate; ferrugineo-testaceous, the body black beneath, the margins of the pronotum and the elytra subhyaline; the antennae testaceous, with the basal and apical joints black; the legs testaceous, with the tarsi and the greater part of the tibiae infuscate; the margins of the pronotum and the costal margin of the elytra to about the middle very minutely denticulate. Head with three short slender frontal spines, meeting at the tip; antennae long and slender, joint one three times as long as two and nearly as long as four, two very short. Pronotum with the membranous margins moderately wide, rounded in front and behind and slightly recurved, with three rows of small areolae; hood rather small, oval, compressed, angularly projecting in front; the three carinae feebly foliaceous, the interspaces closely, finely punctate. Elytra moderately long, arcuately widened from the base, broadly rounded at the tip; discoidal area narrow, barely one-third the length of the elytra, closely reticulated; subcostal area as wide as the discoidal, closely reticulated; costal area with four rows of areoles at the middle, diminishing to three at the base, the areolae, except towards the base, where they are small, moderately large and (like those of the sutural area) subequal in size. Length 2½, breadth 1⅓ millim. Hab. Panama, Caldera in Chiriqui (Champion)."

No record of food plants was given.

Gargaphia magna new species

Head small, black, with frontal spines all short, about the length of the second antennal segment. Basal spines not protruding noticeably in front of hood, more or less decumbent. First three antennal segments dark reddish brown. Basal segment long and very dark. Third segment lighter towards apex. Fourth black except at base. Hairs on antennae very short and fine. Pronotal hood slightly more than twice as long as broad and distinctly higher than median carina. Nervure on crest of hood darkened. Pronotum black, punctate. Parallel carinae normal, rather low and wide apart. Lateral membranous margins rounding, with three rows of areoles, nervures light brown, margin dark brown. Elytra with four rows of areoles in costal area at its greatest width. Subcostal area with four rows and raised to apex of elytra. Nervures of membranous portions not hairy. Three transverse oblique nervures of costal area black, also nervures towards apex of elytra darkened. Areoles of the apical third of the elytra smoky except those of costal area. Legs dark brown. Length, about 5 mm.

Because of its size and coloring this is the most easily recognizable species of the genus known to the author.

Type.—♂; San Bernardino, Paraguay; K. Fiebrig, collector. Type number 22139 in the collection of the United States National Museum.

Food plant unknown.

Gargaphia tiliae Walsh

1864. Walsh, Proc. Ent. Soc. Phila., iii, p. 408.
1886. Uhler, Check List, p. 22.
1887. Provancher, Pet. Faune Ent. Can., iii, p. 159.
1892. Bergroth, Revue d' Ent., xi, p. 264.
1894. Van Duzee, Bull. Buffalo Soc. Nat. Sci., v, p. 181.
1895. Gillette and Baker, Hemip. Colo., p. 57.
1910. Bueno, Journ. N. Y. Ent. Soc., xviii, p. 31.
1910. Smith, Cat. Ins. N. J., edn. 3, p. 149.
1916. Osborn and Drake, Ohio St. Univ. Bull., xx, p. 234.
1917. Drake, Ent. News, xxviii, no. 5, p. 227.
1917. Van Duzee, Catalogue of Hemiptera of North America, p. 217, no. 654.

Head small with spines erect, frontal pair shorter than median spine, inconspicuous. Antennae hairy, first three segments yellowish brown, concolorous, fourth segment black except at base. Pronotal hood small, twice as long as wide. Carinae normal, comparatively low. Pronotum black punctate. Membranous margins rounding, with three or four rows of areoles. Nervures yellowish. Elytra with four or five rows of areoles at the greatest width of the costal area. Subcostal area with three rows of areoles. Apical angle of discoidal area about median. Length of discoidal area about one-half the length of elytra. Nervures of costal area, opposite apical half of discoidal area, darkened. Legs yellow with tarsi and claws black. Length, 4 mm.; width, 2 mm.

The type, a male, number 1150, in the collection of the United States National Museum, has been examined, together with a long series from states including New Hampshire, Connecticut, New York, Virginia, Maryland, North Carolina, Tennessee, Illinois, Missouri, and Wisconsin. The species probably is well distributed over the entire eastern half of the United States and southern Canada.

Basswood appears to be the most common food plant of the species. It has also been recorded on wild cherry.

Gargaphia amorphae Walsh

1864. Walsh, Proc. Ent. Soc. Phila., iii, p. 409.
1886. Uhler, Check List, p. 22.
1892. Bergroth, Revue d'Ent., xi, p. 264.
1904. Wirtner, Ann. Carn. Mus., iii, p. 202.
1910. Smith, Cat. Ins. N. J., edn. 3, p. 149.
1916. Osborn and Drake, Ohio St. Univ. Bull., xx, p. 235.
1917. McAtee, Bull. Brooklyn Ent. Soc., xii, no. 4, p. 79.
1917. Van Duzee, Catalogue of Hemiptera in North America, p. 217, no. 654.

Differing from *tiliae* Walsh only in the slightly smaller and narrower pronotal hood, and in the apical angle of the discoidal area of the elytra not being about median, but instead noticeably nearer the outside than center, thus making the angle larger than in *tiliae*. This is true in both sexes.

The type, a female, numbered 1141, is in the collection of the United States National Museum. Other specimens from West Virginia and North Carolina have been examined.

Walsh records False Indigo (*Amorpha fruticosa*) as its food plant.

Gargaphia fasciata Stål

1873. Stål, Enum. Hemip., iii, p. 125.

Head small, black, all five spines erect, the anterior pair about one-half as long as median spine. Median and basal spines about equal in length. First three segments of antennae yellowish brown, fourth black. Hairs short and comparatively few in numbers. Pronotal hood small, twice as long as broad. Pronotum black. Parallel carinae normal. Lateral membranous margins rounding, with four rows of areoles at point of greatest width. Nervures of membranous portions yellowish brown, no dark markings except discoidal area somewhat darkened toward apex. Costal area of elytra with five rows of areoles at point of greatest width. Subcostal area with three rows. Apical angle of discoidal area nearly median, slightly nearer outer side. Length, 4 mm.; width, 2.2 mm.

Four specimens in the C. F. Baker collection, which is on deposit in the United States National Museum, are the only representatives of this species which I have examined. They bear a label which states that the determination was made by Champion. The specimens are from Alabama. No record of a food plant is given.

Fasciata Stål has been placed, by Osborn and Drake in 1916 and Van Duzee in 1917, as a synonym of *tiliae* Walsh. Osborn and Drake state that their conviction was confirmed by Heidemann. This error of synonomy was probably due to the fact that the specimens Heidemann determined first as *fasciata* were later properly recognized as *tiliae*, and that he never examined the specimens determined by Champion above mentioned.

Fasciata may readily be separated from *tiliae* by the greater length of head spines, greater width of pronotal margins and narrower subcostal area. There is also no darkening of nervures of elytra in *fasciata*, as there is in *tiliae* in the costal area opposite the discoidal area. *Fasciata* more nearly resembles *patricia* Stål.

Gargaphia patricia Stål

1862. *Monanthia (Phyllontochila) patricia* Stål, Stett. ent. Zeit., p. 324.
1873. *Gargaphia patricia* Stål, Enum. Hemip., iii, p. 125.

Head black, frontal pair of spines shorter and lighter than median spine. Basal spines long and more or less decumbent. First three segments of antennae yellowish, concolorous and hairy. Fourth segment black, except at base, and hairy. Pronotal hood small and narrow. Pronotum black, punctate. Carinae normal, comparatively low. Lateral membranous margins rounding with four rows of areoles, nervures more or less darkened. Pronotum and its parts quite hairy. Elytra with four rows of areoles in the costal area and subcostal with two. Length of discoidal area less than one half length of elytra. Apical angle of discoidal area about median. Four or five transverse oblique nervures in costal area darkened. Legs pale, tarsi and claws black. Length, 4½ mm.; width, 2½ mm.

A long series from Cordova, Mexico, collected by the late Mr. Frederick Knab, are in the collection of the United States National Museum, as are other specimens from Atoyac, Mexico, and Volcan de Chiriqui, Panama. Champion also records its occurrence in Guatemala. Nothing is known of its food plants.

Gargaphia albescens Drake

1917. Drake, Ent. News, xxviii, p. 228.

Small, elongate. Head with spines short. Basal pair somewhat decumbent. First two and fourth segments black, except basal third of fourth. Antennae very finely pubescent. Pronotal hood comparatively large for the size of the insect. Carinae normal, with a distinct row of areoles, nearly parallel for entire length, slightly farther apart in front. Lateral margins rounding with two rows of areoles in costal area, subcostal with two, and discoidal with three. Length of discoidal area about one-half of length of elytra. All membranous portions more or less hairy and clear white. Legs whitish. No color markings. Length, 3 mm.; width, 1.3 mm.

Type locality: Sacramento, California. Type in collection of Mr. C. J. Drake. Eleven specimens from this locality are in the United States National Museum collection.

There are no recorded food plants.

Gargaphia iridescens Champion

1897. Champion, Biol. Centr.-Amer., Heteropt., ii, p. 10, pl. 2, fig. 1.
1917. Drake, Ent. News, xxviii, p. 227.
1917. Van Duzee, Catalogue of Hemiptera of North America, p. 217, no 655.

Resembles *opacula* Uhler, from which it can be separated by a slightly wider and more flaring membranous margin of the pronotum, and by the three rows of areoles in the costal area of elytra. Otherwise the description given for *opacula* will apply equally as well for *iridescens*. At some later date it may be proved that this is a synonym of *opacula*. Intergradations between the two have been at hand for study, but the writer hardly feels warranted in making this a synonym of *opacula* with but this sort of evidence.

Specimens have been examined from California, Arizona, New Mexico, and Texas. Champion records it from North Mexico.

Food plant records include *Ambrosia* species, *Solanum* species, *Malva* species, and sand nettle.

Gargaphia condensa new species

Head with spines erect, basal spines long. First two and fourth segments of antennae black, third reddish brown. Pronotal hood small, about twice as long as broad. Pronotum black, membranous portions hairy. Carinae parallel and low. Lateral margins angular, with three rows of areoles at widest part. Nervures yellowish brown to dark reddish brown. Elytra with two regular rows of areoles in costal area, two rows in subcostal and three rows in discoidal. Nervures dark reddish brown except on raised portions of elytra where they are yellowish. Black spot near apex of discoidal area. Legs dark reddish brown, tarsi and claws black. Length, 2.8 mm.; width, 1.1 mm.

Type, ♀; *allotype*, ♂; *paratypes*, two females and five males: Santa Rita Mountains, Arizona. Collected by Mr. E. A. Schwarz. All in the collection of the United States National Museum, Type number 22140.

Food plant is recorded as *Dahlia parryi*.

Condensa was a Uhler manuscript name.

Gargaphia vanduzeei new species

Basal pair of head spines long, slender and erect, median spine long and erect, frontal pair short but distinctly spinous. First segment of antennae twice as long as second, third very long, fourth as long as first and second taken together. First, second and fourth segments very dark, third light. Pronotal hood moderately large and broad, carinae moderately high and nearly parallel, lateral membranous margins with two rows of areoles, lateral angles rounding, anterior to which the margins are nearly straight. Elytra with two rows of areoles in costal and subcostal areas. General aspect of insect light yellowish brown, above and beneath. A few transverse nervures of costal area of elytra darkened. Membranous portions of thorax hairy.

Described from a single specimen, which because of its damaged condition will not permit of a more detailed description. It is, however, very evident that it represents a new species.

Type.—♂; Costa Rica, in collection of Mr. E. P. Van Duzee, who kindly permitted the writer to study and describe it.

Gargaphia lasciva new species

Head with spines erect, frontal pair short, basal pair long. First segment of antennae reddish brown, second and third segments concolorous, yellowish, fourth darkened on apical two-thirds. Pronotal hood comparatively large, high, much higher than median carina, narrow. Pronotum brown, carinae parallel and comparatively low, lateral margins rounding with two rows of areoles and wider anteriorly than posteriorly. Nervures of membranous portions yellow and not hairy. Elytra narrowed at base and apex, apex pointing outward. Costal area with two rows of large areoles, subcostal with four rows, and discoidal with three. Subcostal equal or slightly greater in width than discoidal area. An oblique fuscus band across elytra from inner margin opposite apex of discoidal area to apex of elytra. Areoles clouded. Three or four transverse veins in basal half of costal area darkened. Legs light. Length, 3 mm.

Type.—♂; Pará, Brazil, collection of the United States National Museum. Type number 22141.

No record of food plant.

Gargaphia opacula Uhler

1893. Uhler, North Amer. Fauna, vii, p. 263.
1894. Uhler, Proc. Calif. Acad. Sci., ser. 2, iv, p. 178.
1894. C. H. T., Townsend, Can. Ent., xxvi, p. 313.
1914. Van Duzee, Trans. San Diego Soc. Nat. Hist., ii, p. 11.
1917. Van Duzee, Catalogue of Hemiptera of America, p. 218, no. 656.

Head black, eyes prominent, spines prominent and erect, pronotal pair rather small. First two and fourth segments of antennae black, third yellowish. Pronotum very convex and hairy. Hood not as high as median carina. Three carinae straight, parallel, and comparatively low and thick. Lateral margins carinate, with but one row of areoles and fitting close to pronotum. Elytra whitish with nervures yellowish or brown. Costal area with two rows of areoles and subcostal with three rows. Legs brown, tarsi and claws black. Length, 3 mm.; width, 1.2 mm.

The type, a female, numbered 1189, from the Argus Mountains, California, and numerous other specimens from California, Utah, and Kansas, are in the collection of the United States National Museum. A specimen from California is labeled "on *Dahlia spinosa.*" Van Duzee records specimens captured from willow. Mr. C. H. T. Townsend records having found it abundant on young egg-plants at Las Cruces, New Mexico.

Gargaphia carinata new species

Head spines long and erect, yellow. Head black, shiny. First two and fourth segments of antennae black, third yellowish brown. Pronotal hood of medium size, about twice as long as broad. Three parallel carinae higher than hood with a row of large clear areoles. Lateral membranous margins angular and distinctly short. Membranous portions with long hairs. Elytra narrow and elongate with two rows of areoles in costal area, three in subcostal, and four in discoidal. Discoidal area about one-half the length of elytra. Nervures of elytra various shades of brown, without pattern. General appearance brown. Legs light. Length, 2.5 mm.; width, 1.1 mm.

Type.—♀; Santa Rita Mountains, Arizona. Collected by Mr. E. A. Schwarz. In collection of the United States National Museum. Type number 22142.

This is very distinct from any other species of the genus and easily can be recognized by its small size, high pronotal carinae, and short membranous margins of pronotum.

No record of any food plant is available.

The types of the following species have not been available nor has the author seen any specimens identified as belonging to these species. He requested material for study from various American hemipterologists, but in none of the collections examined were representatives of these species found. The best that can be done under the conditions, and until such a time as the types are available, is to consider them according to Stål's[1] treatise of the genus, and to apply his differentiations to the author's divisions as set forth in the key to the species.

Formosa Stål, *trichoptera* Stål, and *subpilosa* come within the division containing species whose costal areas have four or more rows of areoles at their widest part. *Formosa,* whose type locality is Rio Janeiro, is listed by Stål with *patricia* Stål and *fasciata* Stål. *Trichoptera,* whose type locality is Bogotá, Colombia, is compared with *nigrinervis.* It is much larger than *nigrinervis.* According to Berg,[2] *subpilosa* Berg, with type locality Buenos Ayres, differs from *trichoptera* in the smaller number of hairs, principally on the lower part of the body, in the very high angle of the lateral membrane of the pronotum, and in its smaller size. It also differs from *nigrinervis* Stål in the hairs which are on the hemelytra, in the hairs scanty and very short on the abdomen, and in the much elevated angle of the lateral membrane of the pronotum.

Gargaphia flexuosa Stål, *lunulata* Mayr, *munda* Stål, *simulans* Stål, *obliqua* Stål, and *tricolor* Mayr, all belong to the division having less than four rows of areolae in the costal area. *Flexuosa* and *lunulata* have two rows of areolae in costal area while the other species have three rows. Stål states that while *flexuosa* and *lunulata* are very similar, *lunulata* is much the paler. The writer suspects that could the types be examined *lunulata* would be place into synonomy with *flexuosa.* The type locality for both is Rio Janeiro.

Obliqua is separated from *munda* and *simulans* by having the lateral margins of the pronotum much wider. *Simulans* is smaller than *munda,* otherwise greatly resembling it, and may prove to be a synonym of *munda.* The type locality of *munda, simulans,* and *obliqua* is also Rio Janeiro.

[1] Enum. Hem., 1873, no. 3, p. 124.

[2] Hem. Argentina, 1879, p. 137.

The description of *tricolor* by Mayr, from Venezuela, is based largely upon color characters, and hence cannot easily be closely associated with any of the afore-mentioned species.